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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/539,792

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Marc Husemann

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EXAMINER

REDDY, KARUNA P

ART UNIT

PAPER NUMBER

1796

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/539,792	<b>Applicant(s)</b> HUSEMANN ET AL.	
	<b>Examiner</b> KARUNA P. REDDY	<b>Art Unit</b> 1796	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 July 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6, 9-12, 14-17, 19 and 20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 9-12, 14-17 and 19-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. This office action is in response to the amendment filed 7/7/2008. Claims 1-2 are amended; and claims 7-8, 13 and 18 are cancelled. Accordingly, claims 1-6, 9-12, 14-17 and 19-20 are currently pending in the application.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### ***Claim Rejections - 35 USC § 103***

3. Claims 1-2, 4-5, 9-12, 14-17 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidt et al (5,910,522).

Schmidt et al disclose an adhesive comprising a transparent polymer and/or polymerizable oligomer and/or polymerizable monomer suitable for use as an adhesive, nanoscale inorganic particles and optionally compounds for surface modification of said inorganic particles (column 8, claim 1). Polymers that can be employed as transparent polymers include polyacrylates and polyvinyl compounds. Instead of the mentioned polymers, oligomers and/or precursors (monomers) thereof may be employed as well (column 3, lines 39-61). The listing of nanoscale inorganic particles includes silicates (column 4, line 6) and has a particle size preferably from 2 to 50 nm (column 4, lines 36-37). Suitable surface modifier, i.e. surface modifying low molecular weight compounds have at least one functional group capable of reacting with groups present on the surface of powdered particles. Thus an acid/base reaction may take place between the functional groups of surface modifying compound and surface groups of particles

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(column 5, lines 29-48). Examples of surface modifier compounds include mono and polycarboxylic acids having 1 to 12 carbon atoms such as acrylic acid and methacrylic acid as well as their esters e.g. methyl methacrylate (column 5, lines 55-63).

The polymer and polymerizable compounds may be dissolved in or mixed into a stable dispersion of the nanoscale particles, optionally with addition of the surface modifying substances (column 6, lines 44-48). If polymerizable compounds are used, the adhesive also contains thermal or photochemical crosslinking initiators (column 6, lines 49-54). If the adhesive contains a crosslinkable compound, said compound is crosslinked and cured thermally and/or by irradiation depending on the type of crosslinking initiator employed (column 7, lines 19-24). Examples of thermal initiators include azobisisobutyronitrile, dibenzoyl peroxide and t-butylperbenzoate (column 7, lines 1-6).

A working example of the preparation of adhesive includes mixing methyl methacrylate,  $\text{SiO}_2$  and styrene (column 7, lines 53-56). The density of methyl methacrylate and styrene is  $0.933 \text{ g/cm}^3$  and  $0.907 \text{ g/cm}^3$  respectively (Knovel critical tables – Publication 2003). Therefore, ratio of methyl methacrylate and styrene in working example will read on the weight percentages used in claim 4. The finished adhesive is applied onto a substrate or said substrate is dipped into said adhesive (column 7, lines 13-14).

Schmidt et al is silent with respect to coating of filler (i.e. silicate and/or silica gel) with polyacrylate that is chemically bonded to a free-radical initiator which free radical initiator is chemically bonded to silicate and/or silica gel.

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However, Schmidt et al teach surface modification of inorganic particles with compounds comprising at least one functional group capable of reacting with groups present on the surface of powdered particles which include silicates. The compounds which are capable of reacting with the surface of powdered particles include acrylic acid, methacrylic acid and methyl methacrylate. Given that polymerizable compounds and surface modifying compounds are mixed with stable nanoparticle dispersion and can contain thermal initiators such as azobisisobutyronitrile, it would have been obvious to one skilled in the art to recognize that during the mixing process thermal initiators comprising functional groups would interact to some degree with functional groups on both silica particles and surface modifying substances such as acrylic acid, methacrylic acid and methyl methacrylate, and that the surface modifying compounds would in fact polymerize during thermal curing process to form a coating of polyacrylate on the surface of silicate and/or silica gel containing chemically attached thermal initiators.

4. Claims 1-2, 4-6, 9-12, 14-17 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Husemann et al (US 6,958,186 B2) in view of Schmidt (5,910,522).

Husemann et al discloses a double-sided adhesive tape comprising a layer of polyacrylate PSA (abstract). The polyacrylate PSA layer is composed of at least the following monomers i.e. 79 to 100% by weight of (meth)acrylates and/or their free acids with the formula  $\text{CH}_2=\text{C}(\text{R}_3)(\text{COOR}_4)$  where  $\text{R}_3$  is H or  $\text{CH}_3$  and  $\text{R}_4$  is H or alkyl chains having from 1 to 30 carbon atoms and up to 30% by weight of olefinically unsaturated monomers containing functional groups (column 8, lines 2-10). Examples of the olefinically unsaturated monomers include hydroxypropyl acrylate, hydroxyethyl methacrylate, maleic anhydride, itaconic acid and aromatic vinyl compounds such as styrene (column 8, lines 53-67, column 9, lines 1-10). Furthermore, it is possible

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optionally to add fillers such as silicates (column 13, 61-64) to the adhesive composition. The polymerization may be carried out in bulk, in the presence of one or more organic solvents, in the presence of water or in mixtures of water and organic solvents (column 9, lines 54-56). A range of polymerization methods in accordance with which the polyacrylate PSAs may alternatively be prepared can be chosen (column 13, lines 4-6). For optional cross-linking with UV light, UV-absorbing photoinitiators are added to the acrylate containing PSA's (column 14, lines 16-18). It is also possible to crosslink the acrylate containing PSA with electron beams (column 14, lines 45-47). The polyacrylate PSA is coated onto release paper or release film (column 20, lines 28-29).

Husemann et al is silent with respect to size of fillers such as silicates and/or silica gel; and coating of the filler (i.e. silicate and/or silica gel) with polyacrylate that is chemically bonded to a free-radical initiator which free radical initiator is chemically bonded to silicate and/or silica gel.

However, Schmidt et al teach an adhesive composition comprising polymers and nanoscale inorganic particles (column 8, claim 1) such as silicates (column 4, line 11). These nanoscale particles usually have a particle size of preferably 2 to 50 nm (column 4, lines 36-38). The inclusion of nanoscale particles result in retention of optical transparency and a steep increase in thermo-mechanical properties of the adhesive (column 2, lines 8-13). The composition can comprise compounds which have at least one functional group capable of reacting with groups present on the surface of powdered particles (column 5, lines 29-48). Thus an acid/base reaction may take place between the functional groups of surface modifying compound and surface groups of powdered particles (column 5, lines 29-33). The compounds which are capable of reacting with the surface of powdered particles include acrylic acid, methacrylic acid and methyl

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methacrylate (column 5, lines 55-63). Therefore, it would have been obvious to one of ordinary skill in the art at the time invention was made to use nanoscale silicate particles, of Schmidt et al, as fillers in PSA composition of Husemann et al, for above mentioned advantage.

With respect to the coating of silicate and/or silica gel particles with polyacrylate that is chemically bonded to a free-radical initiator which free radical initiator is chemically bonded to silicate and/or silica gel, Schmidt et al teach that polymer and polymerizable compounds may be dissolved in or mixed into a stable dispersion of the nanoscale particles, optionally with addition of the surface modifying substances (column 6, lines 44-48). If polymerizable compounds are used, the adhesive also contains thermal or photochemical crosslinking initiators (column 6, lines 49-54). If the adhesive contains a crosslinkable compound, said compound is crosslinked and cured thermally and/or by irradiation depending on the type of crosslinking initiator employed (column 7, lines 19-24). Examples of thermal initiators include azobisisobutyronitrile, dibenzoyl peroxide and t-butylperbenzoate (column 7, lines 1-6). Given that polymerizable compounds and surface modifying compounds are mixed with stable nanoparticle dispersion and can contain thermal initiators such as azobisisobutyronitrile, it would have been obvious to one skilled in the art to recognize that during the mixing process thermal initiators comprising functional groups would interact to some degree with functional groups on both silica particles and surface modifying substances such as acrylic acid, methacrylic acid and methyl methacrylate, and that the surface modifying compounds would in fact polymerize during thermal curing process to form a coating of polyacrylate on the surface of silicate and/or silica gel containing chemically attached thermal initiators.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidt et al (5,910,522) as evidenced by Knovel (Knovel critical tables – Publication 2003).

The discussion with respect to Schmidt et al in paragraph 4 above is incorporated herein by reference.

Schmidt et al is silent with respect to weight fraction of polyacrylate coated particles of silicate and/or silica gel.

However, the proportion of nanoscale particles in adhesive composition of Schmidt et al is from 1 to 50 % by volume (column 4, lines 55-56) and weight fraction of instant claim is from 0.5 to 25. The density of inorganic silicates varies over a wide range from 2.0 to 6.5. Therefore, volume percentages of silicate in Schmidt et al encompasses weight fraction of present claim.

### ***Response to Arguments***

6. Applicant's arguments, filed 7/7/2008, with respect to rejection of claim 2 under 35 U.S.C. 112, second paragraph have been fully considered and are persuasive. The rejection of claim 2 under 35 U.S.C. 112, second paragraph has been withdrawn in view of the amendment to claim 2.
7. Applicant's arguments, filed 7/7/2008, with respect to prior art rejections in paragraphs 4-6 of office action mailed 1/4/2008, have been fully considered but they are not persuasive. Specifically, applicant argues that (A) the limitation of claim 7 is now incorporated into independent claim 1; (B) examiner has not made out a prima facie



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case of obviousness for the limitation "polyacrylate-coated particles of silicate and/or silica gel have been functionalized with a free radical initiator" in claim 7.

With respect to (A), it is noted that the recitation "polyacrylate-coated particles of silicate and/or silica gel have been functionalized with a free radical initiator" of previously presented claim 7 is different from the limitation "coating of a polyacrylate chemically bonded to a free-radical initiator which free-radical initiator is chemically bonded to said silicate and/or silica gel" in the presently amended claim 1.

With respect to (B), given that polymerizable compounds, surface modifying substances, free radical initiators and silicate particles are present during the curing process and all the components are mixed together, it is the examiner's position that functionalization of silica gel and/or silicate particles with thermal initiators such as azobisisobutyronitrile is implicit in the teachings of Schmidt et al.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KARUNA P. REDDY whose telephone number is (571)272-6566. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. P. R./  
Examiner, Art Unit 1796

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/Vasu Jagannathan/

Supervisory Patent Examiner, Art Unit 1796